Pachanoi or pachanot ?

An illustrated commentary by Keeper Trout

The subject of our conversation

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This could be a fairly complex discussion but its best to start simple and try to keep it that way. At one point I started referring to this as **Trichocereus pachanoi PC** but have some questions so far as regarding this as a bona fide **pachanoi** so I will tongue-in-cheek begin referring to our beloved horticultural "San Pedro" as **Trichocereus pachanot**.

I'm not trying to suggest that this either is or should become its name, it is simply what I will use during this look into a fun bit of cactus identification trivia. My other option would be a more subtle pacha**no** but, as **Pachano** was the proper name of an amazing scientist who was San Pedro's namesake [weblink], **pachanot** it is. (I did not coin any of these names.)

I also should emphasize that those companies who are selling this plant as **pachanoi** are not doing anything wrong or being deceptive. This is now the primary horticultural form that is widely known and recognized as **pachanoi** in the USA. Many people are unfamiliar with anything else and it takes most people some effort simply to find any other forms. It is not clear exactly what percentage of the available horticultural pachanoi in the USA is presently comprised of the **pachanot** but it is certainly well in excess of 90% and possibly may even be in excess of 99%. In most retail plant outlets it is 100%.

I also intend no slight to this gorgeous plant as it is one of my favorite flowering cacti.

The questions being posed here are still valid.

The topic revolves around an observation made by Michael S. Smith:

What is most commonly recognized as **Trichocereus pachanoi** in the USA differs from the published description for **Trichocereus pachanoi**.

His primary point of contention as concerns the **pachanot** is based on the following rather simple comment from Britton & Rose 1920:

"...ovary covered with black curled hairs; axils of scales on flower-tube and fruit bearing long black hairs."

page 134 in The Cactaceae

Its good to remember that Britton & Rose had initially reported **pachanoi** from Ecuador [bookmark] [weblink] and Backeberg expanded its reported range into Peru in the 1930s. Backeberg encountered it at Huancabamba [bookmark] [weblink] being called San Pedro. Many wild collections and herbarium vouchers have been made.

To lessen some unavoidable confusion, its important to be aware that bona fide **pachanoi** commonly exists with long spines and with very short spines [bookmark] [weblink]. Sometimes both can be present on a single plant. Or its spination can be somewhere in between the two extremes.

The crazy range of variability for **pachanoi** itself makes it tempting to dismiss Smith's questions offhand without taking time for a close look.

Just for fun, let's take that closer look.

The reason that comment of Britton & Rose provoked some conflict with the **pachanot** is the latter typically shows white, light brown or grey woolly hair on the ovary, tube and fruit.

Hair color seems like a really trivial feature to make very much of anything out of, especially considering how most other features on these cacti can be so extremely variable. This is yet another reason that it's easy to dismiss this subject without giving it much thought.

If it had just been Britton & Rose's description it could have ended there.

Fortunately we are lucky enough to have more descriptive comments available to us (and we also have some nice views of what still exists in South America today -- for sake of comparison) [bookmark] [weblink].

If it was just the hair color that was different this conversation would never have begun. It was this small observation however that led us onto what has proven to be an unusually illuminating, thought provoking and valuable pathway of questioning.

Curt Backeberg modified his description of **pachanoi** hair to brown which nicely fits some of the plants still growing where he collected in Peru [weblink].

In the 1931 description that Curt Backeberg wrote for **Cereus pachanoi** Werdermann was the comment:

"Fruchtknoten und Röhre [...] mit langen, braunen Wollhaaren."
page 79 in Neue Kakteen

John Borg made a similar statement in 1937.

"...with ovary and tube covered with long brown hairs."
page 183 in Cacti

However by 1959 the description coming from Backeberg's hand had grown more towards Britton & Rose's black:

"Ov. und Röhre mit schwärzlichen Haaren besetz."
page 1118 in Die Cactaceae

Friedrich Ritter similarly referred to blackish-brown and black in his description of **pachanoi** in 1981:

"Fruchtknoten [...] mit reichlichen schwarzbraunen Wollhaaren"

&

"Blütenröhre [...] langen graugrünen Schuppen und schwarzen, 15–25 mm langen Wollbüscheln"

page 1324 in Kakteen in Südamerika.

In 1984 Carlos Ostolaza wrote another description of **pachanoi** with detailed floristic comments:

"Pericarpel [...] is covered with scales with brownish hairs 15 mm (.6") long on the axils [....] floral tube [...] has fewer scales [...] with more hair on axils."

&

"The fruit [...] covered with scales and black hairs."

page 102 in the Cactus & Succulent Journal (US) 56.

(**pericarpel** = **ovary**)

Another description came from Jens Madsen in 1981:

"[areoles of the floral bracts]...bearing clusters of brownish black, 1-22 mm long, curled and twisted hairs."

page 28 in Flora of Ecuador.

Edward Anderson's 2001 The Cactus Family:

"pericarpels and floral tubes with black hairs"

page 276.

The 2006 New Cactus Lexicon of David Hunt:

"**pc** [pericarpel] and **hyp** [hypanthium] with black hairs"

page 98.

(**hypanthium** = **tube**)

Hmmm.

There seems to be something amiss with our 'San Pedro' [bookmark] [weblink].

While I may be accused of splitting hairs, the next three photos should raise some questions.

"...ovary covered with black curled hairs;
axils of scales on flower-tube [...] bearing long black hairs."?

"...fruit bearing long black hairs."?

This fruit has seen its surface features fortuitously exposed by rain.
This example is the "blackest" hair we have encountered on a pachanot fruit.

Several questions spring to mind but I have no real answer for any of them:

What happened here?

&

How, where & when did this come to be the predominate **pachanoi** in US horticulture?

No matter what the answers turn out to be, there are two topics that exist as a result of this observation:

Topic 1: **'Backeberg's clone' is a misnomer – as the pachanot did not come from Backeberg. See views of the so-called "Backeberg's clone" compared to what Backeberg actually knew as pachanoi [bookmark] [weblink] on the following pages.**

Topic 2: **The pachanot and pachanoi may look similar but they have predictable differences if their flowers and/or fruit can be examined. Compare South American Trichocereus pachanoi to the "pachanot" in the USA [bookmark] [weblink].**

Take a look at a pachanoi in Ecuador today.

More images of pachanoi in Ecuador and Peru will be found farther below.

Topic 1: **Backeberg's clone & why it appears to be mythology**

I unfortunately helped to widely propagate this mistaken identification (now urban legend) in print by including it in my books **Sacred Cacti** and **San Pedro**.

What most people refer to as Backeberg's clone is the predominate cactus sold as **Trichocereus pachanoi** in US horticulture. For many years most of us in Western horticulture knew only this plant as the San Pedro cactus.

You have all no doubt seen many thousands of feet of it growing in countless people's gardens in multiple states.

It is even featured in the center of the cover of my San Pedro book which has an entire section of photographs more or less devoted to it.

While the search is still ongoing and far from complete, thusfar I can find no proof that this plant is known from the wild. The search is still ongoing so stayed tuned.

Just to be sure that our subject is clear, here is an example or three of the pachanot (all of these three are growing in California):

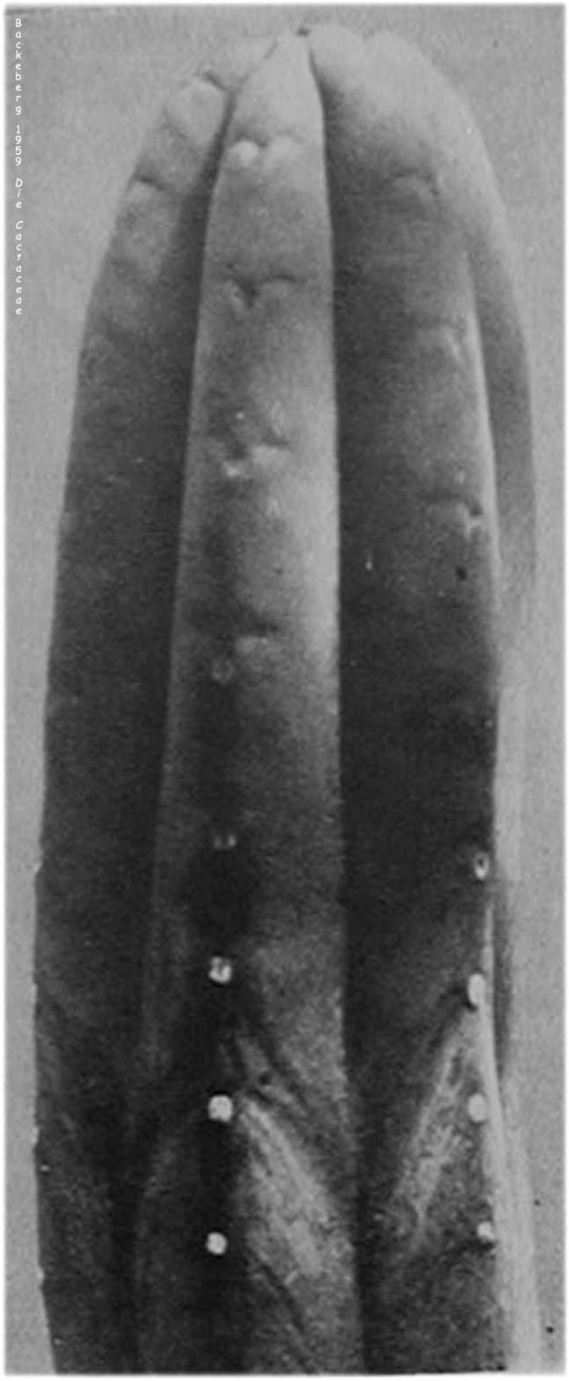
Copyright by Keeper Trout

And a close-up of a fairly typical tip.

And of a fairly typical areole.

And another picture showing a flowering plant in Oakland.

Below, on the other hand, is Backeberg's photo of a bona fide **Trichocereus pachanoi** from Huancabamba Peru. This image was taken from his 1959 **Die Cactaceae**:



The differences are both subtle and not so subtle. It is extremely valuable to pay attention and learn to differentiate them from each other.

Whatever the pachanot turns out to be it is clearly not the same creature that Backeberg shows above. For those who are not yet convinced, please bear with me and check out some more images of **bona fide** pachanoi.

This next image is a bona fide **pachanoi** growing in shaman's garden near Cuzco, Peru (Photo copyright Geneva Photography)

Notice how nicely this matches Backeberg's photo and how different it is from the predominate cultivar in the USA?

This image will reappear with more comments elsewhere here but we wanted to have a copy here for an easy comparison with the other images being shown.

This is a close-up of a tip of a Peruvian **pachanoi** (the shininess is due to this tip cutting having been handled excessively).

More of the same from Peru (these tips were harvested at Matucana) but these were obtained through an unrelated source.

These two cuttings spent some months in the postal system

Some pachanoi from Knize in Lima, Peru (4 images)

Another view of another bona fide **Trichocereus pachanoi** in Peru.

Photograph above is copyright Grizzly.

Just to be sure that no one forgets bona fide pachanoi can be variably spiny.
[weblink]

Quito, Ecuador
Copyright by Hubbie Smidlak 2008

pachanoi
at Quito, Ecuador

Copyright Hubbie Smidlak 2008

Copyright Hubbie Seidlick 2008

Copyright Hubbie Seidick 2008

Copyright Hubbie Seidlak 2008

Copyright Hubbie-Bilbrack 2006

Copyright by Hubbie Smidlak 2008

pachanoi
at Vilcabamba, Ecuador.

Copyright Hubbie Smidlak 2008

Copyright Hubert Beidler 2008

This last image is a closer view of the preceding photograph.

Ecuadorian pachanoi copyright by Hubbie Smidlak 2008

pachanoi in Peru

Copyright by Grinzinsky 2008

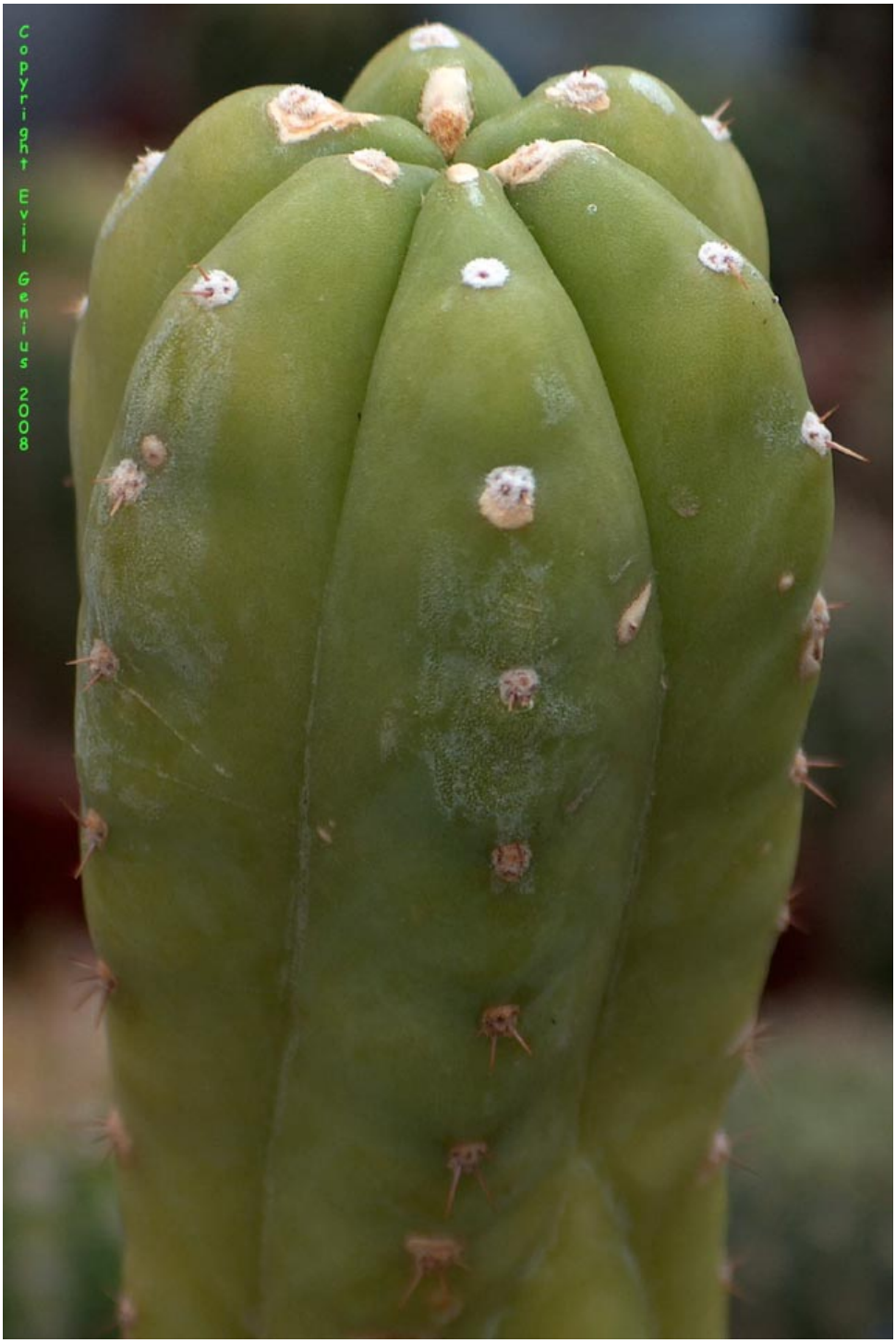
We will explore this subject in more detail but even at this point we could already summarize the end point by saying that the plant now mistakenly called Backeberg's clone (namely our pachanot) is not the same plant Backeberg recognized as **pachanoi** at Huancabamba and purported to have brought into horticulture in Germany in 1931.

We have some questions about this latter claim as well since it appears that pachanoi may already have been in horticulture in the US either by or before 1930 and we have not yet been able to determine that anyone preserved knowledge of which European pachanoi might have come from Backeberg.

Before addressing topic 2, the following is a look at some of the pachanoi offerings that are presently under cultivation in Europe.

Some of the assorted horticultural pachanoi presently in Germany

The first image is of a cultivar originally collected in Peru by a German collector named Kaiserwerth. This is sold under the name Trichocereus peruvianus



This is distributed by a cactus vendor in Spain.

Other pachanoi in German horticulture; these next 7 lack further information.

Copyright Evil Genius 2008

This is the oldest representative of a cactus line sold commercially as a pachanoi that Evil Genius can presently locate in Germany. He has some questions concerning its identity and is working on learning more information.

Topic 2: **South American Trichocereus pachanoi compared to the predominate "pachanot" cultivated in the USA.**

As mentioned I have been referring to this as **pachanoi PC** for 'predominate cultivar' or perhaps the predominate clone since it does seem to be produced entirely vegetatively despite it freely flowering & readily hybridizing — or maybe it should stand for politically correct, I don't know.

Due to questions raised about the culturecentrism of this view as a basis for its designation, as it is not necessarily the predominate cultivar elsewhere in the world, this needs abandonment and replacement.

As a result in this discussion it is jokingly referred to as **Trichocereus pachanot**

This is the primary Western cultivar sold in the US under the names **Trichocereus pachanoi**, San Pedro and sometimes as **Echinopsis peruviana** in southern California.

Let's start this with a look at a San Pedro in South America

This is that same bona fide pachanoi growing in a shaman's garden near Cuzco.

Copyright © by Geneva Photography

Notice the details of the flowers and how smooth edged this plant is? Also how indented/sunken the areoles are and the planar relationship they have to the median of the rib? Take a closer look here [bookmark] [weblink] or farther below. Now go back to Backeberg's **pachanoi** photo [bookmark] [weblink] and compare this and then compare both to the **pachanot** [bookmark] [weblink].

Spines here and in Backeberg's photo are shorter than on the **pachanot** but spine length is something that can almost be disregarded (within reason) for being a variable characteristic [bookmark] [weblink]. When they have short spines, it is a common thing for the short expressions of the spination on **pachanoi** to be consistently much shorter than the already short spines of the **pachanot** [bookmark] [weblink].

Many of the trichs show ranges of characteristics rather than set characteristics so it is easy to become diverted from some important points concerning the predominate cultivar.

a) It does not match the description of **pachanoi** as given by Rose & others in perhaps minor but very consistent ways.

b) It is readily differentiable from the **pachanoi** that seems to be most common in Ecuador and Peru.

c) Thus far it has NOT been encountered in the wild or in use among Peruvian shamans.

d) It shows characteristics of flower and fruit, as well as intensely vigorous growth, that are suggestive of it being a selection derived from a hybrid [weblink].

While a **pachanoiXbridgesii** hybrid is at least plausible (compare pachanot and bridgesii [bookmark] [weblink]), there are other possibilities.

We may never know the answer with any degree of certainty – perhaps not even with a lot of work that is yet to be done.

Below we will examine a series of typical **pachanoi** from South America compared to the **pachanot** that we most commonly have growing in the US.

The first images below were shared by MS Smith. All of these images are said to be of Ecuadorian pachanoi.

The one on the left is said to be a photo of a voucher collected in Ecuador by Timothy Plowman. The ones on the right were said to be taken in Ecuador as well.

We do not know their photographers.

Trichocereus pachanoi in Ecuador
Photographers are unknown but lefthand image is said to be vouchers of Timothy Plowman.

Two Ecuadorian pachanoi sold by Karel Knize in Lima, Peru and shipped to Texas.

Two Ecuadorian collections of *Trichocereus pachanoi* from Karel Knize

Now this is going to start to get interesting or perhaps just boringly repetitive. Feel free to skip ahead whenever that happens.

On the left below is a **pachanoi** in Peru and on the right is a US horticultural **pachanot**.

Pay particular attention to spination, areoles, flower buds, flowers, pericarpels, tubes, fruit and the contour of the ribs.

Trichocereus pachanoi
in a shaman's garden in Peru
Photo copyright by Geneva Photography

Trichocereus pachanot
cultivated in California
Photo copyright by Momma Kitty

Ecuadorian **pachanoi** from Knize (KK339) on the left and on the right **pachanot**

Above: *Trichocereus pachanoi* KK339
from Ecuador via Karel Knize

Right: *Trichocereus pachanot* in California

Ecuadorian **pachanoi** from Knize (KK339) on the left and on the right **pachanot**

Trichocereus pachanoi KK339
from Ecuador via Karel Knize

Trichocereus pachanot in California

bona fide **pachanoi** can sometimes be encountered in the US as is shown on the left (Photo by Anonymous) and on the right is our **pachanot** again.

Bona fide *Trichocereus pachanoi* in California
Photo by Anonymous

Trichocereus pachanot in California

Peruvian **pachanoi** on the left (photograph by Grizzly) and on the right **pachanot**.

Trichocereus pachanoi in Peru
Photo by Grizzly

Trichocereus pachanot in California

Peruvian **pachanoi** from Matucana (photo from Kitzu) -- left; right -- **pachanot**.

Trichocereus pachanoi in Peru
Photo copyright by Kitzu

Trichocereus pachanot in California

Ecuadorian **pachanoi** from Knize on the left and on the right **pachanot**.

Trichocereus pachanoi KK339
from Ecuador via Karel Knize

Trichocereus pachanot in California

Ecuadorian **pachanoi** from Knize on the left and on the right **pachanot**.

Trichocereus pachanoi KK339
from Ecuador via Karel Knize

Trichocereus pachanot in California

Ecuadorian **pachanoi** from Knize on the left and on the right **pachanot**.

Trichocereus pachanoi KK339
from Ecuador via Karel Knize

Trichocereus pachanot in California

Flower buds

Upper left image is from Peru: Photographer is unknown to us.

The bottom left and the entire right column are **pachanot** in California.

Flower buds.
Upper left image is on a plant in Peru,
Photographer is unknown.
The other four images are of
Trichocereus pachanot in California
Photographer was Keeper Trout
Images copyrighted by their photographer

Flower buds

In Peru on left (Geneva Photography)/ On right is the **pachanot**

Trichocereus pachanoi in Peru
Photo copyright by Geneva Photography

Trichocereus pachanot in California
Photo copyright by Trout

A closer look

In Peru on left (Geneva Photography)/ On right is the **pachanot**

Trichocereus pachanoi in Peru
Photo copyright by Geneva Photography

Trichocereus pachanot in California

In Peru on left (Photographer?)/ On right is the **pachanot**

Left: Trichocereus pachanoi in Peru
(Photographer unknown)
Above: Trichocereus pachanot in California

Ovary & tube

In Peru on left (Geneva Photography)/ On right is the **pachanot**

Trichocereus pachanoi in Peru
Photo copyright by Geneva Photography

Trichocereus pachanot in California
Photograph copyright by Keeper Trout

Flower tube

Bona fide **pachanoi** growing in Oz is on left (photo by Zariat) and on right is typical US **pachanot** cultivar.

bona fide *pachanoi* growing in Oz (below)
Photo copyright by Zariat

pachanot growing in Oakland (right)
Photo copyright by Keeper Trout

Flowers

pachanoi near Cuzco, Peru on left (Geneva photography) and **pachanot** in Oakland, California on right

Trichocereus pachanoi in Peru
Photo copyright by Geneva Photography

Trichocereus pachanot in California

Flowers & fruit (upper left is the pachanoi encountered in Peru by Ritter):
Peruvian **pachanoi** on left. The **pachanot** on right were all taken in California.

Ritter 1981
Photo by Momma Kitty
This photograph copyright 2006 by Geneva Photography
bridgesii is in the background
Photo by Trout
Photo by Grizzly

Trichocereus pachanot in California (above right)

Lefthand column
Trichocereus pachanoi in Peru

Images copyrighted by their photographers

The next image is all the US **pachanot** cv.

For **pachanoi** the ovaries were described as being covered with black wool.

While these typically do show very short black or dark brown hairs along the axils of the scales on the tube and similarly on the ovary/fruit they are generally obscured by white and/or light brown and/or greyish wool and can be absent. Compare these next five images with the examples of similar locations on the floral tube, ovary and fruit on the Peruvian **pachanoi** shown above.

Trichocereus pachanot in California

Photo by Trout

Fruit:

Peruvian **pachanoi** on left. **pachanot** on right.

Left-hand column: Trichocereus pachanoi in Peru

Above: Trichocereus pachanot in California

Photos are copyrighted by their photographers

If anyone wonders WHY this cultivar predominates the US market almost to uniformity consider that it shows intense vigor permitting commercial operations such as can be seen below.

Those show but a small part of a single professional propagator's mother plants in southern California (All three photos by correspondent requesting anonymity).

The **pachanot** is much faster growing, more cold tolerant, more rot resistant and more water tolerant than a bona fide **Trichocereus pachanoi**. The simple mechanics of its vegetative propagation combined with its popularity as an ornamental obviously would favor it becoming the predominate horticultural offering over a fairly short period of time (in this case possibly a relatively few decades – <5?).

We are still searching for confirmation that this is what actually occurred. It is clear there were at least several points of introduction.

It is now so prevalent in US horticulture from California to Florida that it is presently fairly rare to encounter anything else being produced commercially.

Several possibilities exist.

It is at least plausible that a collector such as Paul C. Hutchison or Harry Johnson jr might have collected a naturally occurring pachanoiXbridgesii hybrid from Bolivia and the parent plant was later extirpated from the wild during the government's efforts to reduce their enormous stands of mescaline-containing cacti near urban areas during the 1970s (in response to what they regarded to be a "hippy invasion").

Either one of those people might even have produced such a hybrid and sold it through their commercial cactus operations.

However, a simpler answer is also quite plausible (and leads the pack). If the material that Robert Field's father received from Harry Blossfeld in 1935 turns out to be synonymous with the pachanot, that would go far to explain why it appears to be so abundantly present in the USA, Europe AND Oz.

According to Robert Field, Blossfeld sold a total of 12 shares in his massive collecting expedition in order to finance his costs. Those supporting his efforts , including Field, received a massive volume of live cactus including something that certainly at least looks like our pachanot. Someday DNA analysis will confirm or reject that possibility and this note will be updated accordingly

See images of Field's plants at troutsnotes.com [weblink].

If anyone has more information concerning this plant's origin, especially if you have facts to the contrary and/or if you can tell us its precise point of entry into US horticulture, please contact us at:

keepertrout
@
gmail.com

Pachanot & Bridgesii compared

bridgesii (above) ; *pachanot* (below)

***bridgesii* (above) ; *pachanot* (below)**

This last example shows the most & blackest hair we have thusfar encountered on a pachanot flower.

Some forms of Trichocereus bridgesii

Cuttings above left are from Huanuco, Peru. Photograph copyright by Kitzu

We were told that its spines fell off during transportation.

Image above right & next pair below are H 1294 at the Huntington.

These were obtained as 8 seedlings from Curt Backeberg, which they received the 9th of February 1932.

Photographs copyright by Trout.

Both tips above are of aff. bridgesii
(H 79960 at the Huntington)

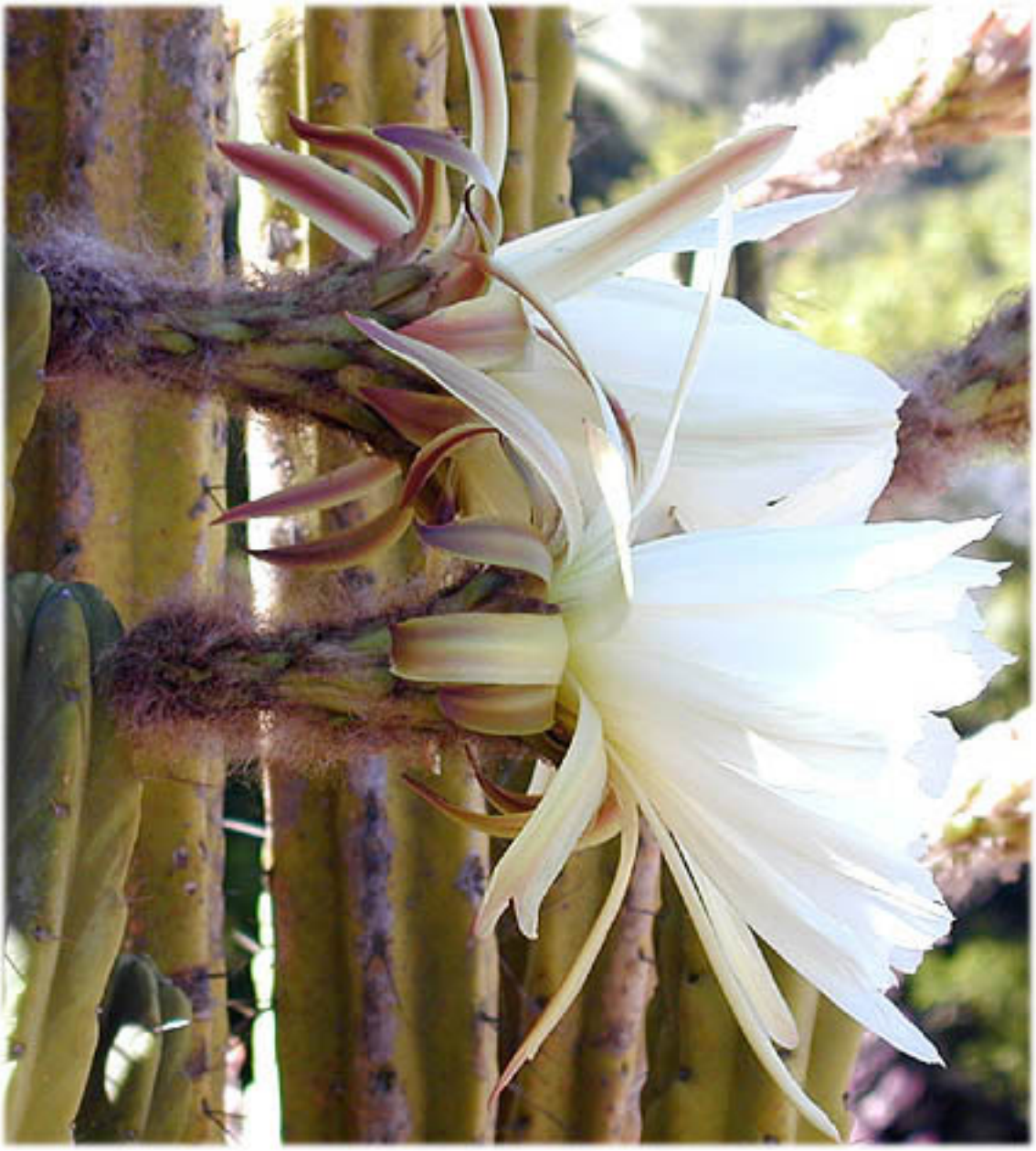
Although most of these are now in cultivation everything depicted above was obtained originally from wild collections.

Some views of bridgesii in Bolivia

Photographs below: copyright by Grizzly

Offerings in the witches markets in Bolivia appear to be for tourists. While some of the tips shown are thus far the closest cacti we have yet seen as concerns the pachanot, they tend to show the presence of some much longer spines which on these cuttings have been removed .

A bridgesii grown from Ritter's seeds that were obtained in 1953.



A couple of oddly stout bridgesii in horticulture.

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